

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-10. (Canceled)

11. (Currently amended) A method of scheduling cable modems in a broadband communications system, comprising:

receiving bandwidth allocation requests from the cable modems;

for each of the bandwidth allocation requests, determining converting each of the bandwidth allocation requests into a mini-slot size based on a modulation and symbol rate associated with a respective the bandwidth allocation requests request; and

scheduling transmission on a physical upstream channel from cable modems associated with each of the bandwidth allocation requests based on a respective mini-slot;

segregating the physical upstream channel into multiple virtual upstream channels, wherein each of the multiple virtual upstream channels is associated with a different modulation and symbol rate;

grouping the cable modems into a plurality of groups; and

assigning a different one of the multiple virtual upstream channels to each of the plurality of groups for upstream transmission.

12-38. (Canceled)

39. (Currently amended) A method, comprising:

grouping cable modems into a plurality of groups, wherein the cable modems are grouped into the plurality of groups based on a latency associated with each of the plurality of groups; and

assigning a different virtual upstream channel to each of the plurality of groups, wherein each virtual upstream channel is associated with a different modulation, symbol rate or preamble.

40. (Canceled)

41. (Previously presented) The method of claim 39, further comprising:

differentiating slower cable modems from faster cable modems; and
assigning bandwidth to the cable modems based on the differentiation such that the slower cable modems are allowed to transmit data proportionately more frequently than faster cable modems.

42. (Currently amended) The method of claim 39, further comprising:

sending a message, that allocates upstream bandwidth, on each of the different virtual upstream channels that allocates upstream bandwidth.

43. (Previously presented) The method of claim 42, wherein each message pertains to cable modems of a group of the plurality of groups assigned to a respective virtual upstream

channel.

44. (Previously presented) The method of claim 39, wherein each virtual upstream channel is associated with a different mini-slot size.

45. (Currently amended) The method of claim 44, wherein a different modulation and symbol rate is associated with each different virtual upstream channel and further comprising:

receiving bandwidth requests from multiple ones of the cable modems;

for each of the bandwidth requests, determining converting each bandwidth request

into a mini-slot size based on the modulation and symbol rate of the virtual upstream channel

to which a respective cable modem is assigned; and

scheduling transmission on a physical channel from cable modems associated with

each of the each bandwidth request requests based on a respective mini-slot size.

46. (Currently amended) A cable modem termination system (CMTS), comprising:

means for grouping cable modems into a plurality of groups, wherein the cable

modems are grouped into the plurality of groups based on a latency associated with each of

the plurality of groups; and

means for assigning a different virtual upstream channel to each of the plurality of groups, wherein each virtual upstream channel is associated with a different modulation, symbol rate or preamble.

47. (Canceled)

48. (Previously presented) The system of claim 46, further comprising:
means for differentiating slower cable modems from faster cable modems; and
means for assigning bandwidth to the cable modems based on the differentiation such
that the slower cable modems are allowed to transmit data proportionately more frequently
than faster cable modems.

49. (Currently amended) The system of claim 46, further comprising:

means for sending a message, that allocates upstream bandwidth, on each of the
different virtual upstream channels ~~that allocates upstream bandwidth~~.

50. (Previously presented) The system of claim 49, wherein each message pertains to
cable modems of a group of the plurality of groups assigned to a respective virtual upstream
channel.

51. (Previously presented) The system of claim 46, wherein each virtual upstream channel
is associated with a different mini-slot size.

52. (Currently amended) The system of claim 51, wherein a different modulation and
symbol rate is associated with each different virtual upstream channel and further comprising:
means for receiving bandwidth requests from multiple ones of the cable modems;

means for determining, for each of the bandwidth requests, converting each bandwidth request into a mini-slot size based on the modulation and symbol rate of the virtual upstream channel to which a respective cable modem is assigned; and

means for scheduling transmission on a physical channel from cable modems associated with each of the bandwidth request requests based on a respective mini-slot size.

53. (New) A method, comprising:

grouping cable modems into different groups based on latencies associated with the cable modems; and

allocating bandwidth request opportunities to each of the different groups of cable modems based on the different latencies associated with each of the groups.

54. (New) The method of claim 53, further comprising:

assigning a different virtual upstream channel to each of the different groups, wherein each virtual upstream channel is associated with a different modulation, symbol rate and/or preamble.

55. (New) The method of claim 54, further comprising:

sending a message that allocates upstream bandwidth on each of the different virtual upstream channels, wherein each message pertains to cable modems of the different groups assigned to a respective virtual upstream channel.

56. (New) The method of claim 54, further comprising:

receiving bandwidth requests from multiples ones of the cable modems;

for each of the bandwidth requests, determining a mini-slot size based on a modulation and symbol rate associated with a respective bandwidth request; and

scheduling transmission on a physical upstream channel from cable modems associated with each of the bandwidth requests based on a respective mini-slot size.

57. (New) A method, comprising:

differentiating slower cable modems from faster cable modems in a cable network;

and

assigning upstream bandwidth to the cable modems based on the differentiation such that the slower cable modems are allowed to transmit data on the upstream proportionately more frequently than faster cable modems.